Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

CHEMICAL COMMUNICATIONS *and* ENQUIRIES.

By ROBERT PERCEVAL, *M.D.* and *M.R.I.A.*

Marine Acid.

Read Nov. 6, 1790.

FOUR pounds of decrepitated ſalt were decompoſed by two pounds of vitriolic acid (ſp. gr. 1,845) diluted with the ſame weight of water. By means of a tubulated receiver, the product was divided into three portions, the two firſt conſiſting each of 12 ounce meaſures, the laſt of 10. The ſpecific gravity of theſe portions was as follows:

1ſt portion	-	1,181
2d	- -	1,119
3d	- - -	1,191

On repeating the experiment, the reſult turned out ſomewhat different, the 1ſt and 2d portions being both ſtronger; this probably depended on the heat having been more moderate in the latter experiment, in conſequence of which leſs marine acid air was loſt than in the former.

Specific

Specific gravity,	1ſt portion	-	-	1,193
	2d	-	-	1,126
	3d	-	-	1,191

THE general concluſion is however the ſame, namely, that what firſt and laſt comes over in diſtillation is ſtronger than the intermediate portion, and this concluſion is confirmed by the reſult of two other experiments, the details of which, as reſembling thoſe deſcribed, need not be recited.

As marine acid air is more volatile than water, we find no difficulty in conceiving how the firſt portion of acid may be the moſt ſaturated; why the laſt portion ſhould be ſtronger than the intermediate is not ſo obviouſly to be accounted for; perhaps, towards the latter end of the proceſs, the vitriolic acid acts on the ſalt in a more concentrated ſtate. At firſt, I imagined that part of this acid paſſed in diſtillation, in conſequence of the increaſed heat, but on examining the laſt portions with a ſolution of nitrated terra ponderoſa, I found that no precipitate was produced but what was eaſily rediſſolved in diſtilled water, and which therefore I concluded did not indicate the preſence of vitriolic acid*.

Nitrous

---

* On adding a ſolution of nitrated terra ponderoſa to pure and ſtrong nitrous or marine acid, I have obſerved an eaſily ſoluble precipitate to be produced. Q. Is this an earthly ſalt with exceſs of acid, or does the acid deprive the ſalt of the water of its ſolution ?

Nitrous Acid.

In the diſtillation of nitrous acid, as in that of marine, the firſt portion is the heavieſt, but, as the diſtillation advances, the ſpecific gravity of the products appears uniformly to diminiſh. Two pounds of nitre were decompoſed by one of concentrated vitriolic acid; the product was divided into three portions, the two firſt conſiſting of 3 ounce meaſures each, the laſt of 2½; their ſpecific gravities were as follow,

1 - -	1,494
2 - -	1,485
3 - -	1,442

As the vitriolic acid in this proceſs is always in its moſt concentrated ſtate, the cauſe on which the increaſed ſpecific gravity of the laſt portion of marine acid ſeems to depend cannot here operate.

Volatile Alkali.

In diſtilling cauſtic volatile alkali, the firſt portions that paſs in diſtillation have the leaſt ſpecific gravity. In the proceſs for cauſtic volatile alkali, according to the Edinburgh Diſpenſatory, the firſt product, amounting to 1 lb. 100 grs. was found to be ,936 at the temperature 58; the ſecond product, weighing 1 lb. 1030 grs.

at the ſame temperature, was ,960. Volatile alkali is always lighter than water, when perfectly cauſtic*. Alkaline air, as well as marine acid air, from its extreme volatility, ſeems diſpoſed to unite moſt copiouſly with the firſt portions of water. That theſe become lighter by uniting with it ſeems to depend on the elaſticity of the alkaline air, which the attractive force that unites it to water is incapable of entirely repreſſing.

Vitriolic Acid.

We are informed by the moſt reſpectable authorities that vitriolic acid has been obtained ſo ſtrong as to be more than twice as heavy as water, but by what proceſs I remain ignorant. I have, though perhaps miſtakenly, ſuſpected that ſuch acid was not pure, but owed its great weight to ſelenite, vitriolated lead or vitriolated alkali, which it contained. I found the ſpecific gravity of common vitriolic acid increaſed from 1,845 to 1,892, by diſſolving in 9 ounce meaſures of it 960 grs. of vitriolated vegetable alkali. Six pounds of common vitriolic acid (ſp. gr. 1,842) were diſtilled until 3134 grs. came over; what remained was concentrated to 1,849. Four pounds of this concentrated acid were heated until the bottom of the retort and the liquor itſelf appeared red, and were expoſed to this heat for above half an hour, during which time copious white

---

* This is not the caſe with the aerated volatile alkali; this liquor, obtained according to the ſame diſpenſatory, was found, in two experiments, to be 1,042.

white ſuffocating fumes paſſed in great abundance; what remained in the retort weighed 2 lbs. 1840 grs. and was concentrated to 1,852. What came over appeared to be as ſtrong as what was at firſt put into the retort. In theſe and other ſimilar experiments, as is well obſerved by Mr. Kirwan, the acid in the retort depoſits a quantity of white powder, which appears to be gypſeous; this it lets fall in ſtill greater quantity when diluted with water. What paſſed over in the laſt mentioned experiment, although very ſtrong, was found to remain clear after dilution. Willing therefore to try what degree of concentration this pure acid would admit, I ſubjected it, together with the product of many ſimilar proceſſes, to the action of a ſtrong fire.

	Grs.
Theſe products weighed - - -	40380
Came over - - -	10680
Remained in retort - - -	29240
Loſt in vapour - - -	-460
Temperature 50. Specific gravity of what came over was - - - - - -	1,394
Specific gravity of what remained in retort, and which bore dilution with diſtilled water without having its tranſparency in the leaſt diſturbed, was -	1,846